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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/798,549

03/10/2004

Gang Duan

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GENENCOR INTERNATIONAL, INC.
ATTENTION: LEGAL DEPARTMENT
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EXAMINER

KAM, CHIH MIN

ART UNIT

PAPER NUMBER

1656

MAIL DATE

DELIVERY MODE

02/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/798,549

Applicant(s)

DUAN ET AL.

Examiner

Chih-Min Kam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-12 and 18-25 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/5/07.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of the Claims

1. Claims 1-12 and 18-25 are pending.

Applicant's amendment filed December 5, 2007 is acknowledged. Applicants' response has been fully considered. Claims 1, 3, 8, 9, 22 and 23 have been amended, and new claims 24-25 have been added. Therefore, claims 1-12 and 18-25 are examined.

Withdrawn Claim Objections

2. The previous objection to claims 4-7, 11, 12, 18, 20 and 22-23 is withdrawn in view of applicants' amendment to the claims in the amendment filed December 5, 2007.

Withdrawn Claim Rejections - 35 USC § 112

3. The previous rejection of claims 8-9 under 35 U.S.C. 112, second paragraph, is withdrawn in view of applicants' amendment to the claims and applicant's response at page 5 in the amendment filed December 5, 2007.

Withdrawn Claim Rejections - 35 USC § 103

4. The previous rejection of claims 1-3, 10, 19 and 21 under 35 U.S.C. 103(a) as being unpatentable over Kohmoto *et al.* (Bifidobacteria Microflora 7(2), 61-69 (1988)) taken with Tomimura (EP 0405283), is withdrawn in view of applicants' amendment to the claims, and applicant's response at pages 5-7 in the amendment filed December 5, 2007.

New Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 8-12, 18, 19 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu *et al.* (J. of Zhenzhou Institute of Technology V22/2, p1-7 (June 2001)) as evidenced by Duan *et al.* (US 2005/0031734).

Lu *et al.* teach enzymatic preparation of isomalto-oligosaccharide using wheat starch as raw material, where the starch slurry is liquefied by thermostable α -amylase "SPEZYME Fred", saccharified by fungal α -amylase "CLARASE L" and transglucosylated by "Transglucosidase L-500" (all from GENENCOR International) and the optimum conditions were obtained, e.g., liquefied to 15-17 DE, saccharified and transglucosylated at 55 °C for 24 hours and pH 4.5 (abstract; page 2; Table 1; claims 1, 3, 4, 10, 18 and 22-25). An *Aspergillus niger* transglucosidase is sold under the tradename of "Transglucosidase L-500", and a thermostable α -amylase can be obtained from *Bacillus licheniformis* or *Bacillus stearothermophilus* as evidenced by Duan *et al.* (US 2005/0031734; paragraphs [0009], [0155]; claims 8-9, 11-12). Lu *et al.* also teach the produced isomalto-oligosaccharide composition can be used in food industry (page 1; claim 19). Although the reference does not specifically indicate the steps of contacting grain ungelatinized starch with a starch liquefying enzyme and a matogenic enzyme to produce maltose (the first and second enzymes together), and contacting the maltose with a transglucosidase (the third enzyme) at the temperature less than or at a starch gelatinization temperature, at the time of invention was made, it would have been obvious to one of ordinary skill in the art to make an isomalto-oligosaccharide composition from wheat as taught by Lu *et al.* using a thermostable α -amylase (the first enzyme) and a fungal α -amylase (the second enzyme) to liquefying the starch slurry and to produce maltose, and a

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transglucosidase (the third enzyme) to produce an isomalto-oligosaccharid composition, or using the three enzymes concurrently (claim 2) because Lu *et al.* teach the same three enzymes are used to react with the same starting material (i.e., grain ungelatinized starch) to produce the same intermediate (i.e., maltose) and the final product (i.e., isomalto-oligosaccharid). The process of grouping of the first and second enzymes together, and then the third enzyme, is not different from the process of using the first enzyme, and then grouping of the second and third enzymes. Thus, the teachings of Lu *et al.* result in the claimed invention and were, as a whole, prima facie obvious at the time it would have claimed invention was made.

6. Claims 1-6, 8-12 and 18-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vercauteren *et al.* (U. S. Patent 6,025,168, published on 2/15/2000) in view of Knight *et al.* (U.S. Patent 3,630,774, published on 12/28/1971) as evidenced by Duan *et al.* (US 2005/0031734).

Vercauteren *et al.* teach a normal production method of isomalto-oligosaccharide (JP 61212296) using a slurry of corn, potato or tapioca starch as raw material, where the starch slurry is liquefied by thermostable α -amylase to a 6 to 10 DE liquefact, which is brought to pH 5 and 60 °C, and β -amylase and transglucosylated are added and the saccharification is continued for 48-72 h, where transglucosidase comes from a fungal source such as *Aspergillus niger*. At the end of saccharification period, the syrup is filtered and refined, and the pure product is concentrated (column 2, lines 24-39; claims 10-12, 18). A thermostable α -amylase can be obtained from *Bacillus licheniformis* or *Bacillus stearothermophilus* as evidenced by Duan *et al.* (US 2005/0031734; paragraphs [0009]; claims 8, 9). Vercauteren *et al.* also teach the produced isomalto-oligosaccharide composition can be used in food industry such as in bakery

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products, canned and bottled foods, and drinks (column 1, lines 15-37; claims 19-21). However, Vercauteren *et al.* do not teach using a ungelatinated grain starch as raw material to prepare an isomalto-oligosaccharide composition.

Knight *et al.* teach corn, wheat, potato, tapioca, rice, sago and sorghum all contain granular starch, and any type of ungelatinized starch may be used as a starting material as long as it is granular in character (column 3, lines 48-65).

At the time of invention was made, it would have been obvious to one of ordinary skill in the art to make an isomalto-oligosaccharide composition from an ungelatinized starch of grain as taught by Knight *et al.* using a thermostable α -amylase (the first enzyme) and a β -amylase (the second enzyme) to liquefying the starch slurry and to produce maltose, and a transglucosidase (the third enzyme) to produce an isomalto-oligosaccharid composition (claim 1, 3-6, 22-25), or using the three enzymes concurrently (claim 2) because the grain ungelatinized starch or slurry of corn, potato or tapioca starch all contain granular starch (see Knight *et al.*), and the same three enzymes (see Vercauteren *et al.*) are used to react with the same ungelatinized starch to produce the same intermediate (i.e., maltose) and final product (i.e., isomalto-oligosaccharid). Thus, the combination of the teachings of Vercauteren *et al.* and Knight *et al.* result in the claimed invention and were, as a whole, prima facie obvious at the time it would have claimed invention was made.

Claim Objections

7. Claim 7 is objected because the claims are dependent from a rejected claim.

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Conclusion

8. Claims 1-6, 8-12 and 18-25 are rejected; and claim 7 is objected to.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathleen Bragdon can be reached at 571-272-0931. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chih-Min Kam, Ph. D.
Primary Patent Examiner



CHIH-MIN KAM
PRIMARY EXAMINER

CMK

February 8, 2008